



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

10/726,244

12/02/2003

John J. Simbal

59121US002

3517

32692

7590

02/23/2006

3M INNOVATIVE PROPERTIES COMPANY

PO BOX 33427

ST. PAUL, MN 55133-3427

EXAMINER

STAHL, MICHAEL J

ART UNIT

PAPER NUMBER

2874

DATE MAILED: 02/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

HA

Office Action Summary	Application No.	Applicant(s)	
	10/726,244	SIMBAL, JOHN J.	
	Examiner	Art Unit	
	Mike Stahl	2874	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 39-44 is/are allowed.
- 6) ☒ Claim(s) 1-4, 9-11, 14-17, 19-23 and 25-28 is/are rejected.
- 7) ☒ Claim(s) 5-8, 12, 13, 18, 24 and 29-38 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 02 December 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>see action</u> . | 6) <input type="checkbox"/> Other: ____. |

Information Disclosure Statement

Attached are initialed copies of citation forms dated as follows: April 15, 2004; August 3, 2004; March 7, 2005; May 2, 2005; and August 15, 2005.

Claim Objections

Claim 33 is objected to because in line 2, “cylinder” should be changed to “coupler”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 9-10, and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Parker (US 4897771).

Claim 1: Parker discloses a reflecting coupler, comprising: a body 2 having an aperture extending therethrough from a first side to a second side, an interior surface of the aperture being reflective, a first portion 10 of the interior surface conforming to a two-dimensional surface (a cylinder in the example) and a second portion 4 of the interior surface conforming to a three dimensional surface (elliptical in the example), the 2-D surface extending at least partially between the first and second sides of the body. See fig. 1.

Claim 2: The first portion is disposed proximate the first side of the body and the second portion is disposed proximate the second side of the body.

Claim 3: In an alternate embodiment, a first aperture edge at the first side of the body is rectangular in shape (fig. 10).

Claim 4: The aperture of the fig. 1 embodiment defines a second aperture 8 edge at the second side of the body, the second aperture edge having a circular shape.

Claim 9: A reflector axis A is defined longitudinally along the center of the aperture between the first and second sides, and the 2-D surface is a surface comprising a surface formed with respect to a 2-D surface axis.

Claim 10: The 2-D surface axis is coincident with the reflector axis.

Claim 14: The aperture defines a second aperture edge at the second side of the body, the second aperture edge conforming substantially to the 3-D surface (the edge of aperture 8 is contiguous with the 3-D surface of second portion 4).

Claim 15: The 3-D surface is a surface of revolution.

Claim 16: A reflector axis A is defined longitudinally along the center of the aperture between the first and second sides and the surface of revolution is a surface of revolution about the reflector axis.

Claim 17: In an alternate embodiment, the surface of revolution may be a paraboloidal surface (col. 9 lns. 25-29).

Claims 1, 4, 9, 11, 14-17, and 19 are rejected under 35 U.S.C. 102(b) as being anticipated by Cerone et al. (US 6343872).

Claim 1: Cerone discloses a reflecting coupler 2, comprising: a body having an aperture extending therethrough from a first side to a second side, an interior surface of the aperture being

Art Unit: 2874

reflective, a first portion **9** of the interior surface conforming to a two-dimensional surface (planar in the example) and a second portion **5a** of the interior surface conforming to a three dimensional surface (paraboloidal or ellipsoidal in the example), the 2-D surface extending at least partially between the first and second sides of the body. See figs. 4-5.

Claim 4: The aperture defines a second aperture edge at the second side of the body, the second aperture edge having a circular shape.

Claim 9: A reflector axis is defined longitudinally along the center of the aperture between the first and second sides, and the 2-D surface is a surface comprising a surface formed with respect to a 2-D surface axis. In this case the 2-D surface axis is regarded as any line which is normal to the plane of surface **9**.

Claim 11: The 2-D surface axis is non-coincident with the reflector axis.

Claim 14: The aperture defines a second aperture edge at the second side of the body, the second aperture edge conforming substantially to the 3-D surface (the edge of aperture **8** is contiguous with the 3-D surface of second portion **4**).

Claim 15: The 3-D surface is a surface of revolution.

Claim 16: A reflector axis is defined longitudinally along the center of the aperture between the first and second sides and the surface of revolution is a surface of revolution about the reflector axis.

Claim 17: In an alternate embodiment, the surface of revolution may be a paraboloidal surface (col. 2 lns. 65-67).

Claim 19: The 2-D surface and the 3-D surface are interleaved.

Claims 1-2, 4, 9-10, 14-17, and 20 are rejected under 35 U.S.C. 102(b) as being anticipated by Davenport et al. (US 5317484).

Claim 1: Davenport discloses a reflecting coupler, comprising: a body having an aperture extending therethrough from a first side to a second side, an interior surface of the aperture being reflective, a first portion **80** of the interior surface conforming to a two-dimensional surface (a cone in the example) and a second portion **90** of the interior surface conforming to a three dimensional surface (paraboloid in the example), the 2-D surface extending at least partially between the first and second sides of the body. See fig. 4.

Claim 2: The first portion is disposed proximate the first side of the body and the second portion is disposed proximate the second side of the body.

Claim 4: The aperture defines a second aperture edge at the second side of the body, the second aperture edge having a circular shape.

Claim 9: A reflector axis **40** is defined longitudinally along the center of the aperture between the first and second sides, and the 2-D surface is a surface comprising a surface formed with respect to a 2-D surface axis.

Claim 10: The 2-D surface axis is coincident with the reflector axis.

Claim 14: The aperture defines a second aperture edge at the second side of the body, the second aperture edge conforming substantially to the 3-D surface (the end **94** is contiguous with the 3-D surface of second portion **90**).

Claim 15: The 3-D surface is a surface of revolution.

Claim 16: A reflector axis **40** is defined longitudinally along the center of the aperture between the first and second sides and the surface of revolution is a surface of revolution about the reflector axis.

Claim 17: The surface of revolution is a paraboloidal surface.

Claim 20: In addition to the components already mentioned with respect to claim 1, the Davenport apparatus includes a first light source **10** disposed proximate the first side of the body so as to emit light into the aperture; and a first optical fiber **14** having an entrance face disposed proximate the second side of the body so as to receive light through the aperture from the first light source.

Claims 27-28 are rejected under 35 U.S.C. 102(b) as being anticipated by Igram (US 5709463).

Claims 27-28: Igram discloses a reflecting coupler **18** comprising: a sheet of material having an aperture extending therethrough from a first surface of the sheet to a second surface of the sheet, a first aperture **44** edge at the first surface of the sheet defining a first perimeter shape (rectangular in the example) having a first number of sides, and a second aperture **54** edge at the second surface of the sheet defining a second perimeter shape (circular in the example) having a second number of sides, the first number of sides being different from the second number of sides, the aperture having an interior reflective surface **52** extending between the first and second aperture edges. See figs. 2-4 and col. 3 lns. 30-44.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21-23 and 25-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Davenport et al. (cited above).

Claim 21: Davenport does not specifically disclose an LED. LEDs are widely known in the art. It would have been obvious to a skilled person to have used the collection optics 16 with an LED light source in order to obtain the disclosed advantages of the collection optics in conjunction with the well known beneficial characteristics of an LED.

Claim 22: Davenport does not specifically disclose a plurality of light sources associated with a plurality of respective optical fibers and a plurality of respective reflecting couplers. However, it has been held that mere duplication of parts is obvious unless a new and unexpected result is produced (In re Harza \ 124 USPQ 378). To the extent that Davenport is directed to a lighting system, it would have been obvious to a skilled person to employ a plurality of the disclosed lighting systems either to apply more light to a single area or to apply light to multiple areas.

Claim 23: To arrange the light sources, reflecting couplers, and optical fibers in respective arrays would have been obvious to a skilled person since this would achieve an orderly arrangement of the respective parts.

Claim 25: It would have been obvious to a skilled person to bundle together the plurality of fibers and have their collective outputs at an illumination unit, since this corresponds to the case of applying more light to a single area as proposed above with regard to claim 22.

Claim 26: A power source would inherently be provided in the system proposed above with regard to claim 22, since an individual light source as disclosed by Davenport requires a power input in order to emit light.

Allowable Subject Matter

Claims 39-44 are allowed. Claims 5-8, 12-13, 18, 24, and 29-38 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims (and if claim 33 is amended to overcome the above informality objection).

Claim 5 requires that the 2-D surface is an aspheric cylinder. This limitation is not disclosed or suggested by any of the references applied to base claim 1. Claims 6-8 contain allowable subject matter by virtue of dependence from claim 5.

Claim 12 requires an LED located at the first side of the body to emit light into the aperture, the LED having a first emitting surface non-perpendicular to the reflector axis, and the 2-D surface axis passing through the first emitting surface. These limitations are not disclosed or suggested by Cerone, which is the only reference applied to parent claim 11. It is noted that US 2003/0173575 discloses relevant subject matter but does not meet all the requirements of the claim. Claim 13 depends from claim 12.

Claim 18 requires that the reflecting surface conforms substantially to four aspherically cylindrical surfaces near the first side, and conforms substantially to a surface of revolution near the second side. This geometry is not shown or suggested in any of the references applied to base claim 1.

Claim 24 requires that the reflecting couplers are formed in a sheet of material, the material of the sheet comprising the body. The Davenport reference applied to parent claim 22 does not disclose or suggest this structure. It is noted that the examiner is interpreting “formed in *a sheet* of material” as meaning that the plurality of couplers set forth in claim 22 are formed in a single common sheet of material.

Claim 29 requires that a first portion of the interior reflective surface conforms to a 2-D surface and a second portion of the interior reflective surface conforms to a 3-D surface. Igram is the only reference applied to base claim 27, and this reference fails to disclose or suggest the recited surface geometry. It is noted that the examiner is interpreting “2-D” and “3-D” surfaces according to applicant’s special definition of these terms at pp. 8-9 of the specification. Claims 30-38 depend from claim 29.

Claim 39 is essentially identical to claim 27 except for the added limitations involving the light source and the optical fiber. The reflecting coupler 18 of Igram is intended to provide a uniform illumination for backlighting an LCD (see e.g. fig. 2). To include an optical fiber having an entrance face near the second aperture edge of the coupler would be unnecessary and contrary to the operation of the device. Various prior art references such as US 5748816, US 6104446, and US 4964025 disclose reflecting couplers with input and output aperture edges having different numbers of sides, but they do not disclose or suggest using those couplers in

Art Unit: 2874

coupling a light source to an optical fiber. None of the prior art of record is deemed to anticipate or render obvious all the limitations of claim 39. Claims 40-44 are allowable by dependence from claim 39.

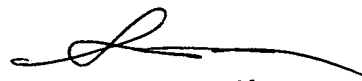
Conclusion

The additional references listed on the attached PTO-892 form are considered pertinent to the subject matter of this application.

Inquiries about this letter should be directed to Mike Stahl at 571-272-2360. Inquiries of a general or clerical nature (e.g., a request for a missing form or paper, etc.) should be directed to the technical support staff supervisor at 571-272-1626. Official correspondence which is eligible for submission by facsimile and which pertains to this application may be faxed to 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Questions about the Private PAIR system should be directed to the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mike Stahl *MJS*
Patent Examiner
Art Unit 2874

February 16, 2006


SUNG PAK
PRIMARY EXAMINER